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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,798	03/22/2004	Justin K. Brask	ITL.0894D1US (P15193)	1055

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Timothy N. Trop  
TROP, PRUNER & HU, P.C.  
STE 100  
8554 KATY FWY  
HOUSTON, TX 77024-1841

EXAMINER

MENZ, DOUGLAS M

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 05/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/805,798

Applicant(s)

BRASK ET AL.

Examiner

Douglas M. Menz

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 36-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Bernhardt et al. (US 53895964).

Regarding claim 36, Bernhardt discloses a semiconductor structure comprising:  
a substrate (11) containing a germanium region (Figs. 4-6 and Col. 2, lines: 33-38), a metal contact (36); and a germanide layer (23 and 31) located between the germanium region and the metal contact (Figs. 4-6 and Col. 4, line 28 – Col. 5, line 19).

Regarding claim 37, Bernhardt further discloses wherein the germanide layer contacts the metal contact and the germanium region (Col. 5, lines: 1-19).

Regarding claim 38, Bernhardt further discloses wherein the germanide layer comprises a nickel germanide layer (Col. 5, lines: 1-19).

Regarding claim 39, Bernhardt further discloses wherein the germanide layer comprises a silicon germanide layer (Col. 5, lines: 1-19).

Regarding claim 40, Bernhardt further discloses wherein the metal contact (32) is associated with one of a source and a drain of a transistor (Fig. 6).

Regarding claim 41, Bernhardt discloses an apparatus comprising:  
a transistor drain region (36), a transistor source region (37), a first metal contact (32A); a second metal contact (32B), a first germanide layer (23A and 31A) located between a germanium region of a semiconductor structure and the first metal contact; and a second germanide layer (23B and 31B) located between the germanium region and the second metal contact (32B, Figs. 4-6 and Col. 4, line 28 – Col. 5, line 19 and Col. 2, lines: 33-38):

Regarding claim 42, Bernhardt further discloses wherein the germanide layer contacts the metal contact and the germanium region (Col. 5, lines: 1-19).

Regarding claim 43, Bernhardt further discloses wherein the germanide layer comprises a nickel germanide layer (Col. 5, lines: 1-19).

Regarding claim 44, Bernhardt further discloses wherein the germanide layer comprises a silicon germanide layer (Col. 5, lines: 1-19).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bernhardt et al. (US 53895964) in view of Chau et al. (US 6777759).

Regarding claims 45 and 46, Bernhardt discloses the apparatus of claim 41, however, Bernhardt does not disclose further comprising: a silicide region comprising a nickel silicide; and a transistor gate region in contact with the silicide region. Chau discloses a transistor structure (Figs. 1A-E) which has a silicide region (110) comprising

a nickel silicide; and a transistor gate region (107) in contact with the silicide region (Figs. 1A-E and Col. 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate Chau's silicide regions into Bernhardt's structure for the purpose of reducing the electrode's resistance as taught by Chau (Col. 1).

### ***Response to Arguments***

Applicant's arguments filed 3/7/05 have been fully considered but they are not persuasive.

Applicant argues that the Bernhardt reference discloses a gallium arsenide substrate and therefore, does not disclose a substrate containing a germanium region. This is incorrect, Bernhardt discloses that substrate 11 is gallium arsenide **or** other III-V compound semiconductor substrate (Col. 2, lines: 35-40). Therefore, the limitation "a substrate containing a germanium region" is anticipated by the Bernhardt reference.

Applicant further argues that the present application discusses at length a sonic technique to etch a metal, such as nickel, in a semiconductor structure that includes a germanide film and a germanium containing substrate without etching the germanide films and any germanium regions on the substrate and that the Bernhardt reference fails to teach such a technique. This is correct, however, applicant only claims a semiconductor **structure** for which the limitations have been met by the Bernhardt reference (*see above rejection*).

Applicant further argues that Bernhardt fails to teach a technique for etching a nickel germanide layer. Again, Applicant only claims a semiconductor **structure**. Thus

regarding the claim 38 limitation of "wherein the germanide layer comprises a nickel germanide layer", Bernhardt anticipates this limitation (Col. 5, lines: 8-14).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas M. Menz whose telephone number is 571-272-1877. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2891

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DM



Christian Wilson

Primary Examiner AU 2891